

REMARKS

Claims 1-13, 18-30, 35-47, 52-63, 69-71, and 86-97 were rejected. Claims 14-17, 31-34, 48-51, 64-68, 82-85, and 98-102 were allowed.

Allowed Claims

Claims 14-17, 31-34, 48-51, 64-68, 82-85, and 98-102 were allowed. Applicants thank the Examiner for these allowed claims.

Claims Rejections under 35 U.S.C. § 102(b)

Claims 1-10, 18-29, 35-44, 52-79, and 86-92 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 6,348,986 to Doucet (hereinafter "Doucet"). Applicants respectfully disagree for the reasons and explanations set forth below.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." M.P.E.P. § 2131 (Aug. 2001) (*quoting Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)). "The identical invention must be shown in as complete detail as is contained in the . . . claim." *Id.* (*quoting Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1051, 1053 (Fed. Cir. 1987)). In addition, "the reference must be enabling and describe the applicant's invention sufficiently to have placed it in possession of a person of ordinary skill in the field of the invention." *In re Paulsen*, 30 F.3d 1475, 1479, 31 USPQ2d 1671, 1673 (Fed. Cir. 1994).

Applicants respectfully submit that claims 1-10, 18-29, 35-44, 52-79, and 86-92 are not anticipated by Doucet for the reasons and explanations set forth below.

With respect to amended claim 1, Applicants respectfully submit that Doucet does not teach or suggest all the limitations of claim 1. In particular, Doucet does not teach or suggest the following element of claim 1: "A method of communication in a mobile radio system".

Doucet discloses a wireless optical transceiver system which includes a passive optical antenna coupled by an optical filter to an active electronics module. The transceiver system receives and transmits light beams from/to the atmosphere and thereby

communicates with a second optical transceiver. (Abstract). Doucet is directed to a method for more efficiently and simply mounting a laser-based communication system. (Col. 4, lines 55-57). The specific problem involved in mounting a laser-based communication system is that the installer/user must adjust the angular orientation of the unit to achieve an optical line of sight (LOS) to a remote communication unit. (Col. 3, line 50-53). Doucet teaches methods of solving the above-stated problem.

In addition, Doucet also discloses a broadcast network. An optical transmitter transmits a broadcast beam to multiple optical receiver systems. Each optical receiver system has a passive optical antenna aimed at the transmission antenna. The optical transmitter embeds an information signal onto the broadcast beam. Each of the passive optical antennas in the system intercept a portion of the broadcast beam. Thus, the passive optical antennas are in relatively close proximity to one another. (Col. 13, lines 44-57).

An optical repeater system is also disclosed in Doucet. An optical repeater includes a passive receive optical antenna, an active electronics module, and a passive transmit optical antenna. The passive receive antenna is coupled to the active electronics module using optical fiber. A second optical fiber connects the active electronics module to the passive transmit antenna. (Col. 13, line 67 – Col. 14 line6).

Doucet does not disclose all the elements of Applicants' invention. Specifically, Doucet discloses laser and optical transmission systems and is not directed to a wireless radio system. Therefore, Doucet does not disclose "A method of communication in a mobile radio system".

Because Doucet does not disclose all the limitations of amended claim 1, Applicants submit that amended claim 1 is not anticipated by Doucet.

The Examiner cites Doucet at column 32, lines 30-49 as disclosing "wherein the coverage of the region comprises sweeping the first beam across the region" in rejecting claims 2 and 3. Applicants respectfully submit that sweeping the first beam across the region is not disclosed by the Doucet reference. Doucet discloses an optical system that depends upon precise sighting and positioning of both optical antennas. Specifically, Doucet discloses:

A data source/sink (not shown) provides data to the primary transceiver unit 3120 to be sent to the subscriber transceiver units 3130. The data source/sink ties into and/or uses existing communication structures such as a telephone network, cable television system, the Internet, or other networks employing Asynchronous Transfer Mode (ATM), switched-ethernet, SONNET, FDDI, Fiber-Channel, Serial Digital Hierarchy, etc. Various means for coupling the data source/sink to the primary transceiver unit 3120 are contemplated, such as fiber-optic cable, satellite up-links and down-links, atmospheric light beams, coaxial cable, microwave links, etc. The light source 3754 generates and atmospherically transmits the first light beam 3140 upon which the beam modulator 3752 modulates the data to be sent to the subscriber transceiver units 3130. A beam adjuster 3720, which preferably comprises an adjustable fine steering mirror, receives and reflects the first light beam 3140 to a lens assembly 3780 and optical antenna 3710 which expand, re-collimate and transmit the first light beam 3140 to the optical router 3110.

Doucet does not disclose “wherein the coverage of the region comprises sweeping the first beam across the region” as found in claim 2. Therefore, Applicants respectfully request that the rejection of claim 2 be withdrawn. Claim 3 is allowable for the same reasons given for claim 2.

Claim 4 is allowable for the same reasons given above for claim 1.

The Examiner cites Doucet, column 14 lines 7-23 as disclosing “wherein the formation of the first beam comprises forming an omni-directional beam” as found in claim 5. Applicants respectfully submit that Doucet does not disclose forming an omni-directional beam. The cited portion reads:

The receive antenna 1210 is oriented in a first direction in order to receive a first light beam B1 from a remote transmitter (not shown). Receive antenna 1210 couples the first light beam B1 onto the first optical fiber 1212. The active electronics module 1215 decouples the first light beam B1 from the first optical fiber B1. Furthermore, active electronics module 1215 includes circuitry (a) to demodulate an information signal from the first light beam, (b) to generate and modulate a second light beam B2 according to the information signal, and (c) to couple the second light beam B2 onto the second optical fiber 1217. Transmit optical antenna 1220 decouples the second light beam B2 from the second optical fiber 1217 and transmits the second light beam B2 to a remote receiver (not shown). In one embodiment of repeater 1200, the transmit wavelength equals the receive wavelength. In another embodiment of repeater 1200, the transmit and receive wavelengths are distinct.

Applicants respectfully submit that the cited portion of the Doucet reference does not disclose "wherein the formation of the first beam comprises forming an omni-directional beam" as found in Applicants' claim 5.

Since claims 6-8 depend either directly or indirectly from claim 1 and include additional limitations, claims 6-8 are also not anticipated by Doucet.

Claims 9 and 10 are allowable as depending from allowable claim 1 and also for the reasons given above for claims 2 and 3.

Claims 18 - 24 are allowable for the reasons given above for claim 1.

The Examiner states that Doucet teaches the receiver system of claim 18 wherein the antenna comprises a plurality of spatially separated elements and rejected claim 26 based on the citation at column 4, line 60 to column 5, line 12. Applicants respectfully submit that claim 26 is allowable as depending from allowable claim 18. Claim 26 is further allowable as the cited prior art does not teach the limitation "plurality of spatially separated elements." The cited portion of the prior art reads:

...for circumventing the necessity of re-sighting the communication system upon repair or upgrade of electronics is greatly to be desired. Any method for simplifying user access to the electronic subsystems of the laser-based communication system is desirable. In general, a considerable need exists for a laser-based communication system which realizes significant cost reductions with respect to prior art systems.

Furthermore, in view of the problems associated with wired networks and radio-transmission based networks, a wireless laser-based telecommunications system is desired which provides a number of subscribers with high-bandwidth telecommunication services. In particular, a wireless laser-based telecommunication system is desired that enables a number of subscribers to communicate with a great number of subscribers. A wireless laser-based telecommunications system is further desired which reduces the cost to each subscriber, yet maintains high-speed, bi-directional, broadband, wide area telecommunications.

Applicants respectfully submit that the Doucet does not teach the limitation "plurality of spatially separated elements" and request that the rejection of claim 26 be withdrawn.

Claim 27 depends from claim 26 and includes additional limitations. Claim 27 is allowable for the reasons given above for claim 26 and further allowable for the following reason. The Examiner cites Doucet, column 3, line 52- column 4, line 14 as disclosing "wherein the elements comprise first and second groups, the first group

configured to form the first beam and the second group configured to form the second beam." The cited portion reads:

...to achieve an optical line of sight (LOS) to a remote communication unit. The optical antenna of the local unit must be pointed at the optical antenna of the remote unit, and vice versa. This adjustment generally requires coordination between two installation personnel, one located at each site. In order to facilitate the LOS adjustment process, communication units typically include an external sighting scope. An installer/user looks through the sighting scope to determine the current direction of the optical antenna. The sighting scope is typically bore-sighted (i.e. calibrated) at the manufacturing facility. The installer/user adjusts the orientation of the communication unit until the remote antenna is centered in the cross hairs of the sighting scope.

Since the bore-sighting (calibration) of the sighting scope may be comprised by physical disturbances to the sighting scope and/or communication unit, the laser beam transmitted by the optical antenna may not intercept the remote optical antenna when the unit is adjusted only on the basis of the sighting scope. The installer/user may have to execute a search procedure to achieve beam contact with the remote optical antenna. In other words, the installer/user may have to randomly adjust the orientation of the local unit while obtaining feedback from the person at the remote unit to determine when LOS has been achieved. The additional time required to conduct the random search in case of an insufficiently bore-sighted sighting scope significantly adds to the cost of installation.

Although a sighting scope may be bore sighted initially, e.g. in the factory or by trained personnel at a field site, the bore sighting (i.e. calibration) may be compromised over the passage of time. . .

Based on the above, Applicants respectfully submit that Doucet does not disclose the limitation "wherein the elements comprise first and second groups, the first group configured to form the first beam and the second group configured to form the second beam." Therefore, claim 27 is allowable.

Because claim 28 depends from claim 27 which in turn depends indirectly from claim 18, and includes additional limitations, claim 28 is also not anticipated by Doucet.

Because claim 29 depends from claim 28 which in turn depends indirectly from claim 18, and includes additional limitations, claim 29 is also not anticipated by Doucet.

Claim 35 has been amended to include "in a mobile radio system" as claim 1 was amended. Applicants respectfully submit that amended claim 35 is allowable for the reasons given above for claim 1.

Claims 36-44 depend either directly or indirectly from allowable claim 35 and are allowable for the same reasons as given above for claim 35.

Claim 52 has been amended to include "in a mobile radio system." Applicants respectfully submit that claim 52 is allowable for the reasons given above for claim 1.

Since claims 53-58 and 69-79 depend either directly or indirectly from claim 52 and include additional limitations, claims 53-58 and 69-79 are also not anticipated by Doucet.

Claim 86 has been amended to include: "in a mobile radio system" Applicants submit that claim 86 is allowable for the same reasons given above for claim 1.

Since claims 87-92 depend either directly or indirectly from claim 86 and include additional limitations, claims 87-92 are also not anticipated by Doucet.

Claim Rejections under 35 U.S.C. § 103

Claims 11, 45, 59, and 93 were rejected as being unpatentable over Doucet in view of U.S. Patent 6,349,217 to Honcharenko (hereinafter "Honcharenko"). This rejection is respectfully traversed.

To establish a prima facie case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. "The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in Applicants' disclosure." *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Applicants respectfully submit that a prima facie case of obviousness has not been established regarding claims 11, 45, 59, and 93 because the prior art cited does not teach or suggest all the claim limitations. Specifically, the cited prior art does not disclose or suggest the limitation "multiple beam patterns comprising a first beam and a second beam between a first device and a second device to cover a region" within "a mobile radio system" as found in Applicants' invention.

Honcharenko teaches a fixed wireless communication system that embodies two transmission modes. First, a high rate, single carrier scheme is implemented for downlink transmissions from each base station to covered subscriber stations. Second, for uplink transmissions from a subscriber to an assigned base station, a multi-carrier, variable

bandwidth scheme is implemented. Preferably, separate frequency bands are allocated for the uplink and downlink transmissions. (Col. 2, lines 20-34). The antennas used at the base stations are array antennas that may be electronically steered in the direction of a specific subscriber station. (Col. 2, lines 61-64). The antenna beam is steered by adjusting complex weights in the base station's beamformer. (Col. 6, lines 28-31). Honcharenko, in the excerpt cited by the Examiner (Col. 2, lines 20-65) does not teach or suggest "multiple beam patterns comprising a first beam and a second beam between a first device and a second device to cover a region". Honcharenko teaches only one beam pattern, as shown by the following "A base station 12 is then able to move or electronically 'steer' its antenna beam in the direction of a given subscriber station ..." (Col. 2, lines 61-63).

Furthermore, combining Doucet and Honcharenko does not result in Applicants' invention. Combining Doucet and Honcharenko would result in a system that used an optical antenna bore sight system and a steering operation performed according to Honcharenko. Moving the optical beam of Doucet would prevent the optical connection from being made and properly sighted in. Additionally, not sweeping the beam would prevent the mobile radio from maintaining contact. Therefore, it would not be logical to combine the teachings of Doucet with those of Honcharenko. Applicants respectfully request that the rejection of claim 11 be withdrawn.

Claims 45, 59, and 93 are allowable for the same reasons given above for claim 11.

Claim Rejections under 35 U.S.C. § 103

Claims 12, 13, 30, 46, 47, 60-63, 80, 81, 96, and 97 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Doucet in view of U.S. Patent 6,385,181 to Tsutsui (hereinafter "Tsutsui"). Applicants respectfully traverse this rejection.

To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. "The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in Applicants' disclosure." *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Applicants respectfully submit that a prima facie case of obviousness has not been established regarding claims 12, 13, 30, 46, 47, 60-63, 80, 81, 96, and 97 because the prior art cited does not teach or suggest all the claim limitations.

Specifically, as noted above, Doucet does not disclose or teach "a mobile radio system". Further as noted above, Doucet is directed to an optical boresighting system. It would not be obvious to combine an optical boresighting method with an array antenna system for use in a CDMA base station as is taught by Tsutsui. Tsutsui teaches forming a plurality of electric beams by applying beam forming to multipath signals received by a plurality of antenna elements of an array antenna and inputting the beams to dispreading/delay-adjusting units (fingers) provided for respective path of multipaths. Each finger despreads each of the plurality of beams input thereto. (Abstract).

Additionally, there is no reasonable expectation of success in combining Doucet and Tsutsui. Combining Doucet and Tsutsui would result in a optical boresighting system using dispreading fingers similar to those found in a RAKE receiver, not Applicants' invention. Furthermore, because of the difficulty of combining optical signals with radio signals it is doubtful whether such a combination could be made to function. Therefore, Applicants respectfully request that the rejection of claim 12 be withdrawn.

Claims 13, 30, 46, 47, 60-63, 80, 81, 96, and 97 are each allowable as depending either directly or indirectly from an allowable base claim, as well as for the reasons given above for claim 12.

REQUEST FOR ALLOWANCE

In view of the foregoing, Applicants respectfully submit that all pending claims in the present invention are in a condition for allowance, which is earnestly solicited. Should any issues remain unresolved, the Examiner is encouraged to telephone the undersigned at the number provided below.

Respectfully submitted,

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